

WHAT IS CLAIMED IS:

1 1. A substrate processing apparatus comprising:
2 a fluid-providing apparatus which is stationarily arranged adjacent a surface of at least
3 one blow-off outlet, said blow-off outlet provided for blowing off fluid, and
4 a rotating member capable of rotating about said fluid-providing apparatus, wherein said
5 rotating member comprises:

6 a first rotating member comprising a main surface that opposes a substrate to be
7 processed, and

8 a second rotating member being connected to said first rotating member and
9 rotatably driven by a rotation-driving member,

10 wherein said fluid-providing apparatus and said at least one blow-off outlet are offset
11 below the main surface of said first rotating member, and
12 wherein said substrate is held contactlessly above the main surface of said first rotating
13 member and said fluid-providing apparatus when fluid is blown off from said at least one blow-
14 off outlet.

1 2. The substrate processing apparatus of Claim 1, wherein the amount of the offset between
2 a surface comprising said at least one blow-off outlet and said main surface of said first rotating
3 member is about 2 mm or less.

1 3. The substrate processing apparatus of Claim 1, wherein said fluid-providing apparatus
2 comprises a cylindrical blow-off portion, on the surface of which said at least one blow-off outlet
3 is provided, and a first seal portion for forming a non-contact seal between it and said first
4 rotating member;

5 wherein said first rotating member comprises a through hole, in the center of which said
6 blow-off portion is provided, and a second seal portion that fits said first seal portion; and
7 wherein a gap is formed between said blow-off portion and said through hole, and fluid
8 flows out from the gap.

1 4. The substrate processing apparatus of Claim 3, wherein at least one shoulder portion
2 having a radius smaller than a radius of said blow-off outlet is formed on the side of said blow-
3 off outlet.

1 5. A substrate processing apparatus comprising:

2 a fluid-providing means which is stationarily arranged and on the surface of which a

3 plurality of blow-off outlets are provided for blowing off fluid; and

4 a rotating means which is capable of rotating about said fluid-providing means, wherein

5 said rotating means comprises:

6 a first rotating member comprising a main surface that opposes a substrate, and a

7 second rotating member being connected to said first rotating member and rotatably driven; and

8 wherein said plurality of blow-off outlets comprise a first blow-off outlet located in the

9 center, and at least one second blow-off outlet located about said first blow-off outlet, wherein

10 said substrate can be contactlessly held above said first rotating member by blowing off gas from

11 the first blow-off outlet, and liquid can be blown off from said second blow-off outlet to said

12 contactlessly held substrate.

1 6. The substrate processing apparatus of Claim 5, wherein one surface of said substrate is

2 cleaned by the liquid that is blown off from said second blow-off outlet.

1 7. The substrate processing apparatus of Claim 5, wherein said second blow-off outlet

2 located about said at least one first blow-off outlet comprises a plurality of second blow-off

3 outlets.

1 8. The substrate processing apparatus of Claim 5, wherein said substrate processing

2 apparatus comprises a nozzle above said rotating means and is capable of providing liquid to a

3 second surface that is opposite to said one surface of said contactlessly held substrate.

1 9. A substrate processing apparatus comprises:

2 a fluid-providing apparatus having a first and a second diameters, wherein a plurality of
3 blow-off outlets are formed on a surface of said first diameter and a first labyrinth seal portion is
4 formed on a surface of said second diameter, the fluid-providing apparatus further comprising a
5 providing port that is capable of providing fluid to at least said plurality of blow-off outlets; and
6 a rotating member being rotatably mounted to said fluid-providing apparatus;

7 wherein said rotating member comprises a main surface, in the center of which a through
8 hole is formed, wherein the surface of said first diameter of said fluid-providing apparatus is
9 located in said through hole, and said rotating member further comprises a second labyrinth seal
10 portion that fits the first labyrinth seal portion;

11 wherein a first aperture is formed in said first labyrinth seal portion, and said first
12 aperture is connected to said providing port through a first path; and

13 wherein a second aperture is formed in said second labyrinth seal portion, and said
14 second aperture is connected to a second path, and said first aperture and said second aperture
15 are spaced apart.

1 10. The substrate processing apparatus of Claim 9, wherein the fluid provided from said
2 providing port flows through said first path, said first aperture, and said first and second
3 labyrinth seal portions and flows out from a gap between the surface of said first diameter and
4 said through hole.

1 11. The substrate processing apparatus of Claim 9, wherein said second aperture comprises a
2 plurality of apertures, and said second path comprises a plurality of paths being connected to said
3 plurality of apertures, and a plurality of fluid-draining outlets are formed on the side of said

4 rotating member, and said plurality of paths extend in radial directions and connected to said
5 plurality of fluid-draining outlets respectively, and the fluid that is provided from said providing
6 port flows through said first path, said first aperture, and said first and second labyrinth seal
7 portions and can be drained out from said fluid-draining outlets through said second aperture and
8 said second path.

1 12. The substrate processing apparatus of Claim 9, wherein said substrate processing
2 apparatus further comprises a liquid-providing nozzle above said rotating member, and is
3 capable of providing liquid by said liquid-providing nozzle to a second surface that is opposite to
4 a first surface of a substrate.

1 13. The substrate processing apparatus of Claim 9, wherein said liquid-providing apparatus
2 comprises a sensor for detecting the presence of a substrate.

1 14. A substrate processing apparatus comprising:
2 a holding plane comprising a surface, on which a plurality of blow-off outlets is formed
3 and which is arranged stationary, and a main surface that rotates about said surface, and
4 a fluid-providing apparatus to provide fluid to said plurality of blow-off outlets,
5 wherein, by contactlessly holding a substrate above said holding plane by fluid that is
6 blown off from at least one blow-off outlet of said plurality of blow-off outlets, and by blowing
7 off cleaning chemical solutions from at least one blow-off outlet of said plurality of blow-off
8 outlets, one surface of the substrate that is held contactlessly is cleaned.

1 15. The substrate processing apparatus of Claim 14, wherein a gap is formed between said
2 surface and said main surface, and fluid is blown off from said gap.

1 16. A substrate processing method comprising the steps of:
2 placing a substrate above a holding plane which comprises a surface, on which a plurality
3 of blow-off outlets are formed, and a main surface that rotates about said surface;
4 blowing off inert gas from at least one blow-off outlet of said plurality of blow-off outlets
5 to contactlessly holding said substrate above said holding plane; and
6 blowing off chemical solutions for cleaning the substrate from at least one blow-off outlet
7 of said plurality of blow-off outlets.

1 17. The substrate processing method of Claim 16, wherein said surface is kept stationary, and
2 said main surface is rotated, and said contactlessly held substrate is rotated together with said
3 main surface.

1 18. The substrate processing method of Claim 16, wherein fluid is blown off from the gap
2 between the surface that is kept stationary and the main surface that is rotated.

1 19. The substrate processing method of Claim 16, and further comprising blowing off pure
2 water from at least one of said plurality of blow-off outlets for rinsing the substrate that is held
3 contactlessly, after the cleaning step of said substrate.

1 20. The substrate processing method of Claim 19, and further comprising blowing off inert
2 gas from at least one of said plurality of blow-off outlets for drying the substrate that is held
3 contactlessly, after said rinsing step.